

ENERGETICS AND SEASONALITY IN CAPTIVE FEMALE JAPANESE MACAQUES (*MACACA FUSCATA*)

C. Garcia¹, M.A. Huffman², K. Shimizu³, P. Redman⁴, J.R. Speakman⁴

¹*Laboratoire de Dynamique de l'Evolution Humaine UPR 2147, CNRS, Paris, France,* ²*Primate Research Institute, Kyoto University, Inuyama, Aichi, Japan,* ³*Okayama University of Science, Okayama, Japan,* ⁴*University of Aberdeen, Aberdeen, Scotland*

Presenter's Email: cecile.garcia@evolhum.cnrs.fr

The geographic distribution of Japanese macaques includes populations with the northern-most range of any primate species. Females of this species are therefore characterized by physiological adaptations and unique fat deposition mechanisms that facilitate their survival through the sometimes-harsh seasonal conditions of temperate climates, as well as sustaining the metabolic costs of reproduction. Here we explore the relationship between nutritional status, seasonality and reproductive status using morphometrics, isotope-labeled water and leptin measures from 14 captive female Japanese macaques. No seasonal patterns were found in leptin levels, but there were differences between seasons in morphometrics and body composition estimated by stable isotopes, specifically between the beginning and end of the mating season. Females accumulated energy reserves in fall to prepare for mating activity, and to survive the severe conditions of winter. Lactating females had larger total skinfolds relative to non-lactating individuals, and females with older babies at the beginning of the mating season had larger abdominal skinfolds than did those with younger babies. There was a relationship between the likelihood of conception and nutritional status, with females that conceived during one mating season being in better condition at the end of their previous mating season. In conclusion, the use of stable isotopes represents a reliable and promising method to quantify body composition and energetic condition in macaques. Together, these results suggest that, even in captive settings, seasonal breeding has a cost on the energetic demands of mating, and that better condition females could afford the demands of lactation and reproduced more rapidly.

Keywords: body composition, nutritional status, leptin, reproductive state